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10/743,179	12/23/2003	Robert C.U. Yu	118087	7279

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EXAMINER	
DANIELS, MATTHEW J	

ART UNIT	PAPER NUMBER
1791	

NOTIFICATION DATE	DELIVERY MODE
11/20/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/743,179	YU ET AL.	
	Examiner	Art Unit	
	Matthew J. Daniels	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 July 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) *10 and 21* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9,11-20 and 22-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Terminal Disclaimer

1. The terminal disclaimer filed on 11 July 2007 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of application 11/032,731 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Double Patenting

2. Rejections set forth previously under this section are withdrawn in view of the terminal disclaimer filed 11 July 2007.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. **Claims 1, 2, 4-9, 11-14, 16-20, 22, 23, 29 and 30** are rejected under 35 U.S.C. 103(a) as being unpatentable over Foltz (USPN 6277534 B1) in view of Taniishi (USPN 4291505). **As to Claim 1**, Foltz teaches a stress/strain relief process (9:59-67) for a flexible, multilayered web stock including at least one layer to be treated (1:23-34); heating at least the at least one layer to be treated above a glass transition temperature (Tg) of the at least one layer to be treated to

thereby create a heated portion of the at least one layer to be treated (10:63-11:13), a portion of the web stock in proximity to the heated portion of the at least one layer to be treated thereby becoming a heated portion of the web stock (11:8-13), inducing curvature in the heated portion (Fig. 4, Items 176, a, b, 8:62-68), and cooling the heated portion (11:30-47), wherein a processing tube having a diameter of about 1.5 inch is used (12:10).

Foltz is silent to a) the coefficients of thermal expansion being significantly differing, b) passing the multilayered web stock over and in contact with a first wrinkle-reducing roller that spontaneously creates transverse tension stress in the at least one layer to be treated, and c) the center diameter and differential diameter of the concave or reverse crown roller.

However, these aspects of the invention would have been implicit or prima facie obvious for the following reasons:

a) One of ordinary skill at the time of the invention would have recognized that in order for the layers to have a substantial amount of built-in internal strain, as taught by Foltz (2:40-55), they would have implicitly had coefficients of thermal expansion that differed significantly, producing the observed internal strain as a result of contraction during cooling. Alternatively, one of ordinary skill in the art would have recognized that if the layers had coefficients of thermal expansion that were not significantly differing, the layers would have contracted at the same rate, and the observed ripples and internal strain (2:40-55) would have been absent. Thus, in order for Foltz to recognize the internal strain, the coefficients of thermal expansion would have implicitly been significantly differing, as sought by Applicant.

b) Foltz teaches that belt ripples are a known problem (2:40-55), and Taniishi teaches in order to avoid wrinkle formation, it is desirable to introduce a crowned roller to create a transverse stress in the belts (1:23-50).

c) In the combination of Taniishi with Foltz, and in view of Foltz's teaching to use a processing tube of about 1.5 inch (12:10), it would have been obvious to provide a concave or reverse-crown roller having a center diameter similar to that of the processing tube or roll. As to the differential diameter, Taniishi teaches that the basic form of the negative crowning is given by the equation at 5:30-35. One of ordinary skill in the art would have found it obvious to optimize the differential diameter of the negative crown roller in view of Taniishi's teaching that the difference in radius is determined by the purpose of the roller and is selected (6:20-53) to achieve the desired result, namely prevention of wrinkle formation (1:40).

It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to introduce the roller of Taniishi into the process of Foltz prior to the heating process in order to eliminate wrinkles to the heating process in order to avoid setting or annealing the wrinkles into the belt.

As to Claim 2, Foltz teaches at least one heat source (10:43-56). **As to Claims 4 and 7,** the wrinkle-reducing roller of Taniishi is a concave, reverse crown roller, which would act as a flexible (rubber, Taniishi, 6:55) spreader (1:32-40) roller. **As to Claims 5, 6, and 8,** Taniishi teaches that the negative-crowned roller provides a transverse stretching effect (1:23-40), and Taniishi further teaches that the basic form is determined by equation (1) (5:32-35). Taniishi further teaches that the particular variables are selected according to the use of the roller (6:45-50) with the intended effect of inducing transverse stretching to avoid wrinkling (1:23-40).

Therefore, Taniishi recognizes the particular size and shape to be result-effective variables, and optimization of result-effective variables is generally prima facie obvious. See MPEP 2144.05 II and *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to optimize the size and shape of the roller of Taniishi and arrive at the claimed values in order to provide transverse stretching in web stock. **As to Claim 9**, placement of the roller of Taniishi in the process of Foltz prior to the heating step would have been obvious in order to eliminate the wrinkles prior to heating, which would anneal or set the wrinkles into the belt. **As to Claims 11-13**, Foltz teaches a heating step, but is silent to the first and second rollers. Taniishi teaches that first and second rollers are desirably used, where the second roller is either a similar negative crowned roller (1:33) (Claim 12) or a straight roller (1:32-33) (Claim 13) in order to create the transverse stress in the support material between the rollers (1:32-40). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the first and second rollers of Taniishi, the first being prior to the heating step and the second is subsequent to the heating step, into the method of Foltz in order that the transverse stretch and wrinkle-free state be maintained during the heating process. Foltz also suggests that the material be unrolled from a roll (Fig. 4, item 170) and passed over a roller (Fig. 4, item 170) after the treatment cylinder. **As to Claim 14**, Foltz teaches inducing curvature by moving web stock over an arcuate portion of an outer surface [of] a processing treatment cylinder (Fig. 4, treatment cylinder 178).

As to Claim 16, Foltz teaches a stress/strain relief process (9:59-67) for a flexible, multilayered web stock including at least one layer to be treated (1:23-34); providing a

processing tube having an arcuate outer surface (Fig. 4, item 178); moving the web stock toward the processing tube (arrows in Fig. 4 show movement direction); providing a heat source at the processing tube (10:37-56); and heating at least the at least one layer to be treated above a glass transition temperature (Tg) of the at least one layer to be treated to thereby create a heated portion of the at least one layer to be treated (10:63-11:13), wherein a processing tube having a diameter of about 1.5 inch is used (12:10).

Foltz is silent to Foltz is silent to a) providing a first wrinkle reducing roller and moving the web stock towards the first wrinkle-reducing roller to spontaneously create transverse tension stress in the at least one layer to be treated, and b) the coefficients of thermal expansion being significantly differing, and c) the center diameter and differential diameter of the concave or reverse crown roller.

However, these aspects of the invention would have been inherent or prima facie obvious for the following reasons:

a) Foltz teaches that belt ripples are a known problem (2:40-55), and Taniishi teaches in order to avoid wrinkle formation, it is desirable to introduce a crowned roller to create a transverse stress in the belts (1:23-50) by providing a first wrinkle-reducing roller.

b) One of ordinary skill at the time of the invention would have recognized that in order for the layers to have a substantial amount of built-in internal strain, as taught by Foltz (2:40-55), they would have implicitly had coefficients of thermal expansion that differed significantly, producing the observed internal strain as a result of contraction during cooling. Alternatively, one of ordinary skill in the art would have recognized that if the layers had coefficients of thermal expansion that were not significantly differing, the layers would have contracted at the

same rate, and the observed ripples and internal strain (2:40-55) would have been absent. Thus, in order for Foltz to recognize the internal strain, the coefficients of thermal expansion would have implicitly been significantly differing, as sought by Applicant.

c) In the combination of Taniishi with Foltz, and in view of Foltz's teaching to use a processing tube of about 1.5 inch (12:10), it would have been obvious to provide a concave or reverse-crown roller having a center diameter similar to that of the processing tube or roll. As to the differential diameter, Taniishi teaches that the basic form of the negative crowning is given by the equation at 5:30-35. One of ordinary skill in the art would have found it obvious to optimize the differential diameter of the negative crown roller in view of Taniishi's teaching that the difference in radius is determined by the purpose of the roller and is selected (6:20-53) to achieve the desired result, namely prevention of wrinkle formation (1:40).

It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to introduce the roller of Taniishi into the process of Foltz prior to the heating process in order to eliminate wrinkles to the heating process in order to avoid setting or annealing the wrinkles into the belt.

As to Claims 17 and 18, Foltz teaches a charge transport layer provided by a roll or web stock with the charge transport layer facing outwardly (10:1-5). **As to Claim 19**, the wrinkle-reducing roller of Taniishi is a concave, reverse crown roller, which would act as a flexible (rubber, Taniishi, 6:55) spreader (1:32-40) roller. **As to Claim 20**, placement of the roller of Taniishi in the process of Foltz prior to the heating step would have been obvious in order to eliminate the wrinkles prior to heating, which would anneal or set the wrinkles into the belt. **As to Claim 22**, Foltz teaches a heating step, but is silent to the first and second rollers. Taniishi

teaches that first and second rollers are desirably used, in order to create the transverse stress in the support material between the rollers (1:32-40). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the first and second rollers of Taniishi, the first being prior to the heating step and the second is subsequent to the heating step, into the method of Foltz in order that the transverse stretch and wrinkle-free state be maintained during the heating process. **As to Claim 23**, the wrinkle reducing roller of Taniishi would provide the transverse stretching action to either side of the multilayer film of Foltz, therefore either configuration would be obvious in order to provide a transverse stretching action. Additionally, Foltz teaches treating the inner surface of a belt (Fig. 2) to provide a curvature (Fig. 4, belt around item 178) and during use rollers would be provided on the inner, treated surface (Foltz, 1:5-23). It would have been obvious to provide the rollers of Taniishi in the same configuration in which they would be used during the fixing of a toner image, which would place the layer to be treated against the rollers. **As to Claims 29 and 30**, Foltz teaches lowering the temperature of the at least one layer by at least about 20 C below the glass transition temperature of the at least one layer (11:39-47).

4. **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Foltz (USPN 6277534 B1) in view of Taniishi (USPN 4291505), and further in view of Yu (USPN 6068722). Foltz and Taniishi teach the subject matter of Claim 2 above under 35 USC 103(a). **As to Claim 3**, Foltz is silent to an infrared lamp in proximity to the web stock, and placing a reflector around the infrared lamp to focus energy emitted by the infrared lamp into a heating line on the surface of the web stock. However, Yu teaches an infrared lamp (Fig. 6, 6:52-63), and a hemiellipsoidal

reflector for focusing energy (Fig. 6, 6:52-63) onto a heating line on a surface of the web stock (Fig. 6, item 30). Foltz teaches heating by a liquid through the tube (10:40-51), but Yu teaches that heating methods requiring a lengthy time to reach the seam stress release temperature are undesirable because they also heat the supporting cylinder (14:13-28). The method of Yu teaches instantaneously elevating the temperature (15:32-35) and therefore it would have been prima facie obvious to one of ordinary skill in the art to combine the method of Yu with that of Foltz in order to increase the speed and efficiency of the process by instantaneous heating.

5. **Claim 15** is rejected under 35 U.S.C. 103(a) as being unpatentable over Foltz (USPN 6277534 B1) in view of Taniishi (USPN 4291505), and further in view of Wellenhofer (DE 28 33 189 and English translation provided, from which citations are given). Foltz and Taniishi teach the subject matter of Claim 1 above under 35 USC 103(a). **As to Claim 15**, Foltz is silent to directing a cooling stream at the heated portion of the web stock. However, Wellenhofer teaches cooling a heated web stock portion and cooling with a cooling stream (Fig. 1, item 11a). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the cooling stream of Wellenhofer into that of Foltz because Foltz suggests a high rate of cooling (11:41-46) and the cooling stream of Wellenhofer would provide a high rate of cooling (See Wellenhofer, Claim 2).

6. **Claims 24 and 25** are rejected under 35 U.S.C. 103(a) as being unpatentable over Foltz (USPN 6277534 B1) in view of Taniishi (USPN 4291505), and further in view of Yu (USPN 6068722). Foltz and Taniishi teach the subject matter of Claim 16 above under 35 USC 103(a).

As to Claim 24, Foltz teaches heating the process tube, but it silent to "substantially instantly" elevating a localized temperature of the at least one layer treated at the processing tube. However, Yu teaches an infrared lamp (Fig. 6, 6:52-63), and a hemiellipsoidal reflector for focusing energy (Fig. 6, 6:52-63), and it is the Examiner's position that this would provide substantially instant temperature elevation at the processing tube. Foltz teaches heating by a liquid through the tube (10:40-51), but Yu teaches that heating methods requiring a lengthy time to reach the seam stress release temperature are undesirable because they also heat the supporting cylinder (14:13-28). The method of Yu teaches instantaneously elevating the temperature (15:32-35) and therefore it would have been prima facie obvious to one of ordinary skill in the art to combine the method of Yu with that of Foltz in order to increase the speed and efficiency of the process by rapid or instantaneous heating. **As to Claim 25**, Foltz teaches that the at least one layer is heated to between 5 C and 25 C over the glass transition temperature (11:5-13).

7. **Claims 26-28** are rejected under 35 U.S.C. 103(a) as being unpatentable over Foltz (USPN 6277534 B1) in view of Taniishi (USPN 4291505), and further in view of Yu (USPN 6068722) and Wellenhofer (DE 28 33 189 and English translation provided, from which citations are given). Foltz and Taniishi teach the subject matter of Claim 16 above under 35 USC 103(a). **As to Claim 26**, Foltz is silent to the infrared lamp extending over the entire width of the web stock. Yu teaches an infrared lamp (Fig. 6, items 103, 105, 106), but Yu is silent to the lamp extending over the entire width. Wellenhofer teaches that an infrared lamp that would implicitly extend over the entire width of web stock to be treated (Fig. 1, item 3) in order to heat the width of the film simultaneously.

Foltz teaches heating by a liquid through the tube (10:40-51), but Yu teaches that heating methods requiring a lengthy time to reach the seam stress release temperature are undesirable because they also heat the supporting cylinder (14:13-28). The method of Yu teaches instantaneously elevating the temperature (15:32-35) and therefore it would have been prima facie obvious to one of ordinary skill in the art to combine the method of Yu with that of Foltz in order to increase the speed and efficiency of the process by instantaneous heating. It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Wellenhofer with the method of Foltz in order to treat the entire web simultaneously without moving the heater, because doing so would increase the speed and efficiency of the process and improve the heating uniformity. **As to Claims 27 and 28**, Yu suggests a hemi-ellipsoidal reflector (Yu, Fig. 11, Item 330) and positioning the infrared lamp at a focal point of the reflector such that substantially all of the radiant energy would inherently converge at a second focal point (Fig. 6). In the method of Wellenhofer it would be desirable to provide a lamp over the entire width of the web stock to increase the speed, efficiency, and heating uniformity of the process by heating the entire width simultaneously with the infrared (translation, page 15) lamps of Wellenhofer.

Response to Arguments

8. Applicant's arguments filed 11 July 2007 have been fully considered but they are not persuasive. The arguments appear to be on the following grounds:

a) Even without an anti-curl backing layer, the present features will still have significantly different coefficients of thermal expansion. The anti-curl backing layer is optional in the instant invention.

b) The use of the wrinkle-reducing roller eliminates the formation of micro-ripples, which are not the same as the wrinkles of Foltz or Taniishi. The wrinkles addressed by Foltz are wrinkles developed during the operation, and are not micro-ripples. The formation of micro-ripples during the stress/strain relief process is not addressed by Foltz. Compare Example I of the present specification with Comparative Examples I and II in the specification which shows that the micro-ripples are removed by the reverse crown roller.

c) Taniishi does not address micro-ripples or suggest use of a negative crowned roller in a manufacturing process.

9. These arguments are not persuasive for the following reasons:

a) There is no limitation including or excluding an anti-curl backing layer. Because the anti-curl layer would balance against the contraction of the other layers in the method of Foltz, it is submitted that it would have had a coefficient of thermal expansion sufficiently different to restrain the contraction of the other layers. Additionally, note the wide range of materials that make up the belts of Foltz (Fig. 3, 8:18-36) and the individual layers (columns 7 and 8), including flexible insulating materials and electrically conductive materials. Were the coefficients of thermal expansion and contraction the same for all layers, it is submitted that a stress/strain relief would have been unnecessary for the belts of Foltz.

b,c) The instant invention appears to be directed at micro-ripples, but does not distinguish these micro-ripples from any other wrinkles, particularly those of Foltz. Wrinkling appears to be a known problem in both the Foltz and Taniishi inventions, and therefore where Taniishi teaches a solution to the problem (negative crown roller), it is submitted that it would have been obvious to also incorporate the roller into the manufacturing process to provide the same benefits during manufacturing.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Daniels whose telephone number is (571) 272-2450. The examiner can normally be reached on Monday - Friday, 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on (571) 272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MJD 11/12/07

CHRISTINA JOHNSON
SUPERVISORY PATENT EXAMINER